ZOONOTIC & OTHER DISEASES: DESCRIPTIONS & PREVENTION TIPS

Special Note

This reference is only intended for use as a guide. The clinical symptoms for many of these zoonotic diseases are non-specific and could easily be attributed to common symptoms such as the flu. If you think you have one of these diseases you are strongly urged to:

1. Re-examine in detail the circumstances under which you think you acquired the agent.

2. Read about the particular disease in greater depth

3. Consult your physician

This preliminary zoonoses guide has been adapted with permission from a manual developed by the State of California's Department of Game and Fish. It is intended that this guide be continuously updated and revised to describe diseases of concern to all individuals who handle wildlife in Colorado. This manual is by no means all inclusive. A special thanks needs to go to the numerous individuals from the wildlife rehabilitation community and CDOW personnel for their input as well as all the recommendations and input from John Pape of the Colorado Department of Health.

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SELECTED ZOONOTIC DISEASES OF

COLORADO

ARTHROPOD-BORNE VIRAL ENCEPHALITIDES

Organism
A virus transmitted most commonly by ticks and mosquitoes. It may also be transmitted by sandflies, midges and gnats. Cyclic incidence of encephalitides in Colorado peaks about every 5 - 6 years. Cases usually occur from late July through early September.

Infection
The viruses causing the several types of encephalitis are transmitted by the bite of an infective tick or mosquitos. Mosquitos and ticks usually acquire the infection form wild birds, rodents or other mammals. Mosquitoes remain infective for life. Humans and horses are uncommon sources of mosquito and tick infection.

Symptoms
The disease in people can range from a mild case occurring as aseptic meningitis to severe infection with acute onset, headache, high fever, meningeal signs, stupor, disorientation, coma, spasticity, tremors, occasionally convulsions and spastic paralysis.

Treatment
There is no specific treatment.

Prevention Tips
Protective clothing and tick and mosquito repellant are the most effective means of prevention.

Baylisascaris procyonis

Organism
A disease of animals and humans caused by immature stages (larvae) of a parasitic nematode (roundworm) which migrates in the tissues. Adult *Baylisascaris procyonis* worms are found in the small intestine of the raccoon. Similar worms infect skunks and bears. They resemble the common ascarid roundworm of dogs and cats in appearance.

Infection
The raccoon is the normal host for this worm, and in this species, it is rarely the cause of disease. When eggs of *Baylisascaris procyonis* are ingested by other species of warm-blooded animals, the larvae which hatch in the gut may undertake an aberrant migration through tissue, causing widespread damage along their path. Many organs including lung, liver and heart may be affected, but the most important damage usually occurs in the brain. Species in which brain damage have been reported include human beings and a large number of wild and domestic mammals and birds. Raccoons tend to use communal sites for defecation. These latrines, which may be on the ground, in lofts, caves or the crotches of trees, provide potential sites of *Baylisascaris* infection for animals which

forage in these areas. The disease has been reported commonly in woodchucks, squirrels, porcupines, cottontail rabbits and a number of species of ground-foraging birds.

Wildlife rehabilitators need to take particular care in the handling and disposal of raccoon feces in order to avoid potential exposure. Most immature raccoons are infected and they may shed many hundreds of thousands of eggs per day. These eggs will persist for years in the environment, are resistant to common disinfectants. Raccoon feces should never be used as manure and material which may be contaminated with raccoon feces should not be used as feed or bedding for other animals. Caging used for raccoons should not be used for other species in order to minimize transmission of *Baylisascaris.*

Symptoms
As the larval Baylisascaris migrate through the brain of a susceptible host, they cause extensive destruction of brain tissue, and elicit a strong inflammatory response form the host, which itself causes further damage. The result is the development of severe neurological signs such as imbalance, circling and loss of normal fear responses. Often affected animals are suspected of having rabies.

Treatment
If an early diagnosis is made, treatment can be made through the use of prescribed drugs. A late diagnosis can result in fatalities. Children are especially at risk and should never be allowed to handle raccoons or potentially contaminated objects.

BRUCELLOSIS

Organism
Brucellosis is caused by the bacterium *Brucella.* There are several species of *Brucella* depending on whether pigs (*B. suis*), cattle (*B. abortus*), sheep (*B. ovis*), goats (*B. melitensis*) or dogs (*B. canis*) are affected. The disease in these animals generally leads to abortion or decreased reproductive potential. *Brucella ovis* is not zoonotic and *Brucella melitensis* is the most virulent to humans.

Infection
Brucellosis is usually acquired by ingesting dairy products from infected animals or through skin breaks or mucous membrane contacts with infected animal products (meat, blood). Common source animals for infection include cattle, goats, domestic and wild swine and wild ruminants.

Symptoms
Symptoms of brucellosis are non-specific, flu-like and generally sudden in onset following a one week to several month incubation period. Clinical signs include chills, intermittent fever spells, impotence, general aches, insomnia and irritation. The recurring fever spells have given this disease the name "undulant fever". The disease can last from several months to several years and chronic disease can lead to central nervous system and cardiac complications and permanent infection.

Treatment

If a positive diagnosis is made, treatment generally consists of antibiotics. Chronic infections can be difficult to treat.

CANINE DISTEMPER

Organism

Canine distemper is a viral disease common in natural environments throughout the world. The distemper virus is closely related to the human measle virus. All domestic dogs and some wild carnivores including raccoons, coyotes, skunks, fox and mink are susceptible.

Infection

The distemper virus is primarily transmitted through direct or aerosol contact with the secretions from the eyes and noses of infected animals. Contact with urine and feces can also transmit the disease. Limiting direct contact between animals is the most effective control of distemper. Treatment is not a viable option for wild animals showing signs of the disease. Distemper can also be transmitted to domestic dogs. Cats are not susceptible to canine distemper. Feline distemper is a different disease caused by a different virus.

Symptoms

Distemper signs are many, varied and can be confused with rabies. Wild animals with distemper are usually noticed by humans only in the late stages of the disease. Mucous secretions around the eyes and nose are common and frequently obvious signs of the disease. In general, wild animals with distemper behave abnormally. They may appear "friendlier" than expected, lethargic or be seen at unusual hours of the day. Other signs of the disease include coughing and other "cold-like" respiratory symptoms, total or partial paralysis, a dull, rough coat, open sores, licking or biting the body, aimless wandering, twitching, head shaking or other nervous "fits". Animals may appear thin due to a loss of appetite, vomiting or diarrhea.

Treatment

Distemper CANNOT be transmitted to humans, but can be confused with rabies, which is fatal in humans.

CHLAMYDIOSIS

Organism

Chlamydiosis is caused by the rickettsial organism *Chlamydia psittaci* that is found in birds of which parrots are the classic host. Birds clinically affected with *Chlamydia* will manifest diarrhea that is loaded with the organisms. Fecal dust containing the organism contaminates feathers and the environment. *Chlamydia* is quite persistent outside the host. Transmission between birds is by inhalation and the fecal-oral route.

Infection

Chlamydiosis is usually acquired by inhaling fecal dust or dander from turkeys, pigeons, ducks or parrots. The disease is generally seen in turkey processing plant workers or any area where birds are concentrated in large numbers.

Symptoms
Non-specific and flu-like including fever, aches, lack of appetite, headache and pneumonia. The incubation period is 1 - 2 weeks or longer and symptoms last 7 - 10 days. Symptoms are more serious in older individuals (>50 years) or those with underlying respiratory disease.

Treatment
If caught early, antibiotics avoid complications from the disease. The fatality rate is about 1%.

CONTAGIOUS ECTHYMA (ORF)

Organism
Contagious ecthyma (CE) is caused by a parapoxvirus and is found in a wide variety of ruminants (principally sheep and goats). The disease in these animals is manifested as vesicles on the lips, ears, nostrils and teats. Secondary problems such as fly strike on the lesions can worsen the problem. Humans usually acquire the infection by inserting hands and fingers into infected mouths.

Infection
CE is acquired by direct contact with lesions in an infected animal.

Symptoms
Clinical signs of CE are usually localized to the part of the body coming into contact with the source of infection and arise after a 3 - 7 day incubation period. Lesions of CE are confined to the skin and include swelling, vesicle formation and occasional localized lymph node swellings. The condition generally resolves in 2 - 4 weeks.

Treatment
None is indicated

ERYSIPELOID

Organism
Erysipeloid is caused by a bacterium called *Erysipelas rusiopathiae* which is usually found in pigs where it causes clinical disease (arthritis and skin problems). *Erysipelas* will also cause clinical disease in birds (pelicans and poultry) and arthritis in cattle and sheep. *Erysipelas* can persist outside the host.

Infection
Erysipeloid is generally acquired through a skin break exposure with infected animal products (i.e. meat) from a large variety of mammals, birds and marine life (fish, mollusks and crustaceans). The disease is usually seen in swine and poultry processing plants.

Symptoms

At the site of the wound there will be a painful itchy reddening and swelling around a purple core that develops 0 - 7 days after contact with the infected source. Generally only one appendate (i.e. finger) is affected and the disease is self-limiting with recovery occurring within 2 - 4 weeks. In rare cases, a generalized infection occurs accompanied by heart complications.

Treatment
Treatment is generally not necessary as the infection is self-limiting. If necessary, antibiotic treatment is available.

GIARDIASIS

Organism
Giardiasis is caused by the protozoan parasite *Giardia*. The parasite coats the lining of the small intestine and causes diarrhea. Human fecal contamination of water sources and person to person transmission causes many of the cases. Beaver and many other species of wildlife are also reservoirs for this parasite as it is shed from fecal matter. In Colorado an average of 1000 cases of giardia are reported annually.

Infection
Giardiasis is acquired by ingestion of the parasite via water, contaminated food or person to person when good hygiene is not practiced.

Symptoms
Giardiasis has a 1 - 3 week incubation period and is manifested by abdominal pain and diarrhea.

Treatment
Treatment is generally a course of flagel administered by a health care professional.

HANTAVIRUS PULMONARY SYNDROME

Organism
The hantavirus pulmonary syndrome (HPS) is caused by a virus. The primary reservoir for this virus is the deer mouse (*Peromyscus maniculatus*); however, serological evidence has shown that the virus can also be found in various other rodent species (i.e. pinon mice, brush mice and western chipmunks). The rodents infected with the hantavirus do not become ill. The hantavirus is shed in the rodent's saliva, urine and feces and becomes aerosolized.

Infection
People have acquired HPS through inhalation of the hantavirus. Other methods involve introduction of the virus through open wounds and cuts on skin, the eye, ingestion of contaminated food or water and rodent bites. No human-to-human transmission has been identified as of yet. Arthropods are not

known to play a role in the disease transmission. The hantaviral infection identified so far in humans has been associated with areas where rodents congregate and nest (i.e. barns, cabins, garages, etc.).

Symptoms

Clinical signs seen in HPS include many non-specific symptoms (fever, chills, myalgias, gastrointestinal signs) as well as shortness of breath, dizziness, arthralgia, back or chest pain and a rapid onset of severe respiratory distress. The non-specific symptoms persist for several days prior to the onset of the respiratory distress. The respiratory distress gets progressively worse and is caused by pulmonary edema. The disease has a case fatality rate of > 50%.

Treatment

There is no specific treatment. Mechanical respiration is often necessary within 24 hours of admission to a hospital.

HYDATID DISEASE

Organism

Hydatid disease is caused by the tapeworm *Echinococcus gransulosus* which resides in the small intestine of domestic and wild canine species. Canines will shed eggs from the worm that are usually ingested by sheep or deer. The parasite proceeds to form cysts in the liver or lungs of these animals. Humans acquire the infection from canines and are not the normal host for this worm (accidental host). Hydatid disease is not seen currently in Colorado; however, the risk of importation among wild animals does exist. There is also a good risk of importation via fur farm fox.

Infection

Hydatid disease is acquired by ingestion of tapeworm eggs that are generally shed by canine species.

Symptoms

Clinical signs of hydatid disease may be unapparent or reflect the organ where the parasite is located. The tapeworm forms a fluid filled cyst, typically in the liver and lungs; however, any organ is susceptible. The cysts may grow to be over a liter in volume and may cause impairment of organ function. Severe problems can occur if the cysts lodge in the brain. Also, if the cyst ruptures there may be anaphylactic shock and dissemination of the parasite throughout the body. If undetected, the parasite can exist in the body for life.

Treatment

Surgery is the only method to eradicate the cyst once it has formed.

LEPTOSPIROSIS

Organism

Leptospirosis is caused by the spirochete *Leptospira* of which there are numerous species. The organism cannot live long outside the host and thrives best in a warm moist environment. A wide variety of animals are infected including rats, cattle, pigs, sheep, dogs, cats, rodents and some wildlife species. Most animals do not show clinical signs and will shed the organism in urine after a suitable incubation period. Leptospirosis causes jaundice and abortion in animals.

Infection
Leptospirosis is classically acquired by inhalation of aerosolized urine from infected animals. Infection requires contact between skin breaks or mucous membranes and the organism. Contaminated food, water or soil can serve as a vehicle for infection.

Symptoms
After a two-day to two-week incubation period, the disease can adopt two forms. In the less severe case, symptoms include fever, nausea and general aching. In the more severe form, there is in addition the aforementioned symptoms, prostration, diarrhea, constipation, jaundice and kidney malfunction. Recovery may require 1 - 2 months.

Treatment
Antibiotics are used to treat infected humans one a diagnosis is made.

LYME DISEASE

Organism
Lyme disease is caused by the spirochete *Borrelia burgdorferi.* This disease is rare in Colorado, but is thought to circulate between rodents and deer through bites of infected ticks. Human infection occurs when people enter tick habitat. The disease is seasonal, most commonly occurring in summer and fall when ticks are most active. Domestic dogs can be exposed to the organism.

Infection
The organism is acquired by the bite of an infected tick. Evidence of transmission by broken skin or mucous membrane contact with infected game meat is limited and perhaps overstated. The same applies to penetration of the organism through intact skin.

Symptoms
Clinical signs of Lyme disease are non-specific (flu-like) and include aches and pains, fever, malaise and lack of appetite. At times a halo-like reddening around the infective tick bite (erythema chronicum migrans) is noticed 3 - 20 days after the bite, but this is not a consistent finding. After prolonged disease (weeks to months), arthritis, central nervous system and cardiac complications can arise. These complications can be irreversible.

Treatment
Antibiotic therapy works best when the disease is diagnosed early.

PLAGUE

Organism

Plague is caused by the bacterium *Yersinia pestis* that is commonly found in rodents. House cats are very susceptible to clinical plague. Dogs generally manifest only a transient fever.

Infection

Plague does occur in Colorado and under certain circumstances can be transmitted to humans through the blood or tissues from infected rodents. Infection can also be acquired by the bite of infected rodents and aerosol from an infected animal (e.g. domestic cats).

Symptoms

Clinical signs of plague can be non-specific can occur after a 2 - 6 day incubation period. There is fever, chills, generalized pain, diarrhea, shock and prostration. The bubonic form of plague is manifested by painful swellings under the arms and groin. It carries a 20 - 60% death rate. The septicemic form is manifested by central nervous system signs, bloody urine and saliva, and red splotching of the skin. The pulmonary form is manifested by coughing, bloody sputum and respiratory difficulty. It can arise from the previously mentioned two forms. Death rate reported for untreated bubonic, septicemic and pulmonary plague are 60%, 100% and 100% respectively.

Treatment

If diagnosed early enough, plague can be treated with antibiotics.

Q FEVER

Organism

Q fever is caused by the rickettsial organism *Coxiella burnetii*. The organism typically infects domestic ruminants where it rarely causes clinical disease but does concentrate in mammary glands. Human infection with *Coxiella burnetii* is classically acquired from aerosols produced by infected animals. The organism is readily found in rodents, lagomorphs (rabbits) and several species of ticks; however, tick transmission is rare. *Coxiella burnetii* can remain infective outside the host for long periods of time.

Infection

Infection with the Q fever organism is either through inhalation of aerosols from infected animals or their products or, rarely, via bites from infected ticks. Infection is also acquired from contact with placental materials.

Symptoms

Non-specific flu-like symptoms (fever, headaches, chills and pain behind the eyes) follow a two-week to one-month incubation period. In some cases pneumonia can develop. The disease is often inapparent and affected individuals usually convalesce without problems.

Treatment

After a confirmed diagnosis, antibiotics will generally clear the infection.

RABIES

Organism

Rabies is caused by a virus of the genus Lyssavirus. In Colorado, bats have been the only endemic rabies host since about the early 1970's. Across the United States the most common rabies carriers also include raccoons, skunks, fox and bats. All mammals can be infected with the virus although wild carnivores are the most prone to bite a human. Rodents and lagamorph (rabbit) species are rarely ever found to be infected with the virus and are not considered to be a rabies risk. Any wild carnivore that is acting abnormally (excessive friendliness, lack of fear of humans) should be strongly suspected of being infected with rabies. A vaccine is available for humans in high risk occupations (veterinarians, wildlife biologists and wildlife rehabilitators).

Infection

Rabies is acquired by the bite of an infected animal or by contact with the virus through broken skin or mucous membranes.

Symptoms

Rabies can have a two week to over a year incubation period. Clinical signs include anxiety, muscle pain, mood changes and increased salivation. As the disease progresses, there is paralysis of the swallowing muscles, hydrophobia (fear of water), and eventually respiratory paralysis or complete paralysis. The clinical disease lasts 2 - 6 days and invariably ends in death.

Treatment

Once clinical signs develop, there is no hope. If exposed to rabies, aggressive washing of the virus entry site should be carried out immediately. Treatment for non-vaccinated individuals involves a series of inoculations with the rabies vaccine and rabies hyperimmune globulins. Treatment for vaccinated individuals is accomplished with vaccine inoculations to booster their immunity. It is highly recommended that any person who comes into contact with wild carnivores or bats on a regular basis should be pre-immunized against rabies (pre-exposure vaccination). In Colorado, wildlife rehabilitators who rehabilitate bats and skunks are required by regulation to have pre-exposure rabies vaccinations and maintain titers of 1:5 or greater as a condition of their license.

RINGWORM

Organism

A fungal infection of the skin affecting a number of different species of animals including humans. Little information is available on ringworm infection in wild animals; however, it has been diagnosed in mule deer, opossums, foxes, squirrels and other rodents. There are several types of ringworm and they are for the most part adapted to specific hosts.

Infection
Transmission occurs by contact with fungal hyphae and their spores either directly or indirectly in bedding, feed and on other objects. Mild abrasions of the skin are required for the fungus to become established. Fungal hyphae do not invade living tissue, but are confined to the keratinized layer of the skin, hair follicles and hair shafts. Ringworm is most common in young and debilitated animals.

Symptoms
Many ringworm infections show no visible signs and these inapparent carriers act as reservoirs. Ringworm infection is characterized by expanding areas of red, itchy inflamed skin in the shape of a ring. It is also characterized by thickening and crusting in the involved area as well as hair loss. Inflammation varies from mild to severe depending on the species of fungus and host involved. Ringworm in humans is similar to that in animals, but infections transmitted to humans by animals tend to be more severe.

Treatment
Ringworm is rarely a serious condition, but will heal more rapidly with the use of antifungal drugs.

ROCKY MOUNTAIN SPOTTED FEVER

Organism
Rocky Mountain Spotted Fever (RMSF) is caused by the rickettsial organism *Rickettsia rickettsii.* In the wild, the organism circulates between ticks and rodents. Humans become infected either by intruding into tick habitat or by having ticks introduced to the household by pet dogs.

Infection
RMSF is acquired by the bite of an infected tick.

Symptoms
Two to 14 days after a bite of an infected tick, RMSF elicits non-specific symptoms such as headaches, fever, joint and muscle pain. Often times there will be red splotching of the skin. If untreated, central nervous signs such as delirium and insomnia will occur at the end of the first week. Continued infection leads to lung and heart complications. The disease can last several months if not treated.

Treatment
Antibiotics are generally effective in clearing the infection.

SALMONELLOSIS

Organism
Salmonellosis is caused by the bacterium *Salmonella* of which there are many species and types.

Salmonella are found in a wide variety of mammals, birds and reptiles. Clinical signs of salmonellosis in these animals can range from inapparent to raging diarrhea and death, particular in the infirm and immature. The organism persists readily in the environment and humans become infected through contaminated food or other transport media.

Infection
Salmonellosis is acquired by ingestion of infected material. Human infection can be prevented through extra care with person hygiene by persons handling infected animals or material soiled by infected animal feces.

Symptoms
After a 3-hour to 6-day incubation period, an infected individual will have fever, chills, diarrhea, vomiting and nausea. Convalescence requires 2 - 4 days and the individual may shed the organism in the feces for several weeks.

Treatment
Antibiotic therapy may prolong the course of the disease and is not recommended; supportive therapy is the best.

SARCOPTIC MANGE

Organism
Mange is caused by *Sarcoptes scabiei*, one of a group of small skin parasites called mites. The structure of mites are similar to that of ticks; however, unlike ticks they are too small to be seen with the naked eye. *Sarcoptes scabiei* infection have been reported in humans, weasel family (including badgers, otters, minks, skunks, weasels and fishers); the canid family (foxes, coyotes, wolves, domestic dogs); felidae family (domestic and wild forms of cats); bear as well as numerous noncarnivores worldwide. *Sarcoptes* are fairly host specific so that human adapted varieties spread more rapidly on humans than on other species, dog strains spread more readily on dogs, and so on. Cross infections do occur, but are usually temporary. Adult *Sarcoptes* mate in molting pockets near the skin surface. After mating the female uses cutting mouthparts and hooks on its legs to burrow through the skin. As it burrows it lays eggs at a rate of 1 to 3 per day. The eggs hatch and both larval and nymphal stages continue to migrate through the skin.

Infection
Sarcoptes is highly contagious. Transmission typically occurs by direct transfer of mites at any stage of their development. Transmission can also occur indirectly by contact with contaminated objects such as bedding. Mange in wildlife species predominately affects young animals and is more prevalent when populations are high.

Symptoms
Mange infections in animals are characterized by oily skin, crusting, hair loss and scab formation. Infections typically begin on elbows and pinna of ears and can progress to involve large areas of the body. Open wounds are a result of physical damage to the skin (scratching, rubbing the affected area), irritation caused by parasite excretions and the allergic response of the host. Affected skin is

itchy and often there is severe self trauma from scratching and rubbing the affected area. Severely affected animals are frequently emaciated.

Treatment
Acaricides are used to treat infected animals and people. Treatments often have to be repeated over several weeks.

TICK BORNE RELAPSING FEVER

Organism
The causative agent of relapsing fever is the spirochete *Borrelia hermsii.* The vector is a soft tick *(Ornithodoros).*

Infection
Humans become infected when the rodents inhabit houses, cabins or other structures and bring the soft tick with them. The soft ticks live in rodent nests and when the rodent dies, the tick seeks other hosts (i.e. humans). This species of tick feeds intermittently at night and most people are unaware they've been bitten.

Symptoms
Two to 10 days after an infected tick bite, there is a fever of sudden onset, general aching, nose bleeds and vomiting. after a short remission, periodic attacks of fever will continue.

Treatment
Antibiotics will generally control the infection.

TOXOPLASMOSIS

Organism
Toxoplasmosis is caused by the protozoan *Toxoplasma gondii* and is found in a variety of wild and domestic mammals. Toxoplasma needs feline species to complete its life cycle and the parasite is quite common in wild (mountain lions, bobcats, etc.) and domestic felids.

Infection
Infection is usually acquired by ingestion of infected meat or cat feces. Thorough cooking of the meat will kill the parasite.

Symptoms
The disease is mainly of concern for pregnant women where it can cause fetal abnormalities or abortion. Toxoplasmosis is also becoming a disease of concern in immunocompromised patients.

Treatment
If indicated, antibacterial and antiprotozoal medications can clear the infection.

TUBERCULOSIS

Organism
Tuberculosis (TB) is caused by bacterial infection of *Mycobacterium bovis.* Tuberculosis has been diagnosed very rarely in free-ranging wild animals. It is mainly confined to herds of cattle, bison and domestically raised elk and deer.

Infection
TB is spread primarily through inhalation of the bacteria expelled from the lungs of infected animals. Infection can also occur by ingestion of material contaminated by secretions or excretions from infected animals. Infection of humans with *Mycobacterium bovis* cannot be distinguished from infection with *M. tuberculosis* (the human tuberculosis agent).

Symptoms
The disease is characterized by chronic pneumonia, although infected animals may appear normal and healthy for long periods of time even though they are infectious. In advanced cases there is severe respiratory distress and weight loss. In elk and other deer, lesions are often confined to lymph nodes of the head and neck and are sometimes noticeable externally as swellings. Animals with extensive lesions may appear normal.

Treatment
Antibiotic therapy is most commonly used. In severe cases, surgical removal of diseased tissues may be necessary.

TULAREMIA

Organism
Tularemia is caused by the bacterium *Francisella tularensis* and is named for its site of discovery, Tulare County, California. The organism is found in a wide variety of mammals and arthropods. Rodents, lagomorphs (rabbits), and furbearers are most commonly infected and are the source of infection for arthropods (ticks). rodents and lagomorphs generally die from tularemia and lesions in these animals consist of abscessed lymph nodes and spotted spleen. Although other mammals can be infected, they generally do not show clinical signs. The organism can persist outside the host.

Infection
Tularemia can be acquired by bites from infected ticks, ingestion, aerosol or through broken skin and mucous membrane contact with infected tissues.

Symptoms
After a 1 - 10 day incubation period there is a fever of sudden onset, non-specific pain, vomiting and headache. At the area of contact (tick bite, mucous membrane, wound), there will be ulceration

(festering) and swelling of associated lymph nodes. Tularemia can also be manifested as pneumonia or ulceration of the GI tract and general GI irritation. The disease usually lasts 3 - 5 weeks and convalescence can last several months.

Treatment
Therapy for tularemia is antibiotics.